



Academy

California Academy of Sciences – Golden Gate Park

February/March 1999

BATS! Furry Friends or Frightful Foe?

Cal Academy Partners With China

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To explore and explain the natural world

STEINHART AQUARIUM • MORRISON PLANETARIUM • NATURAL HISTORY MUSEUM

Executive Director's Message

In the last edition of the Academy newsletter, I told you about a process we are undertaking to plan thoughtfully and strategically for our future. As I said then, "You, our members, can provide us with an honest appraisal of what you think of the Academy,

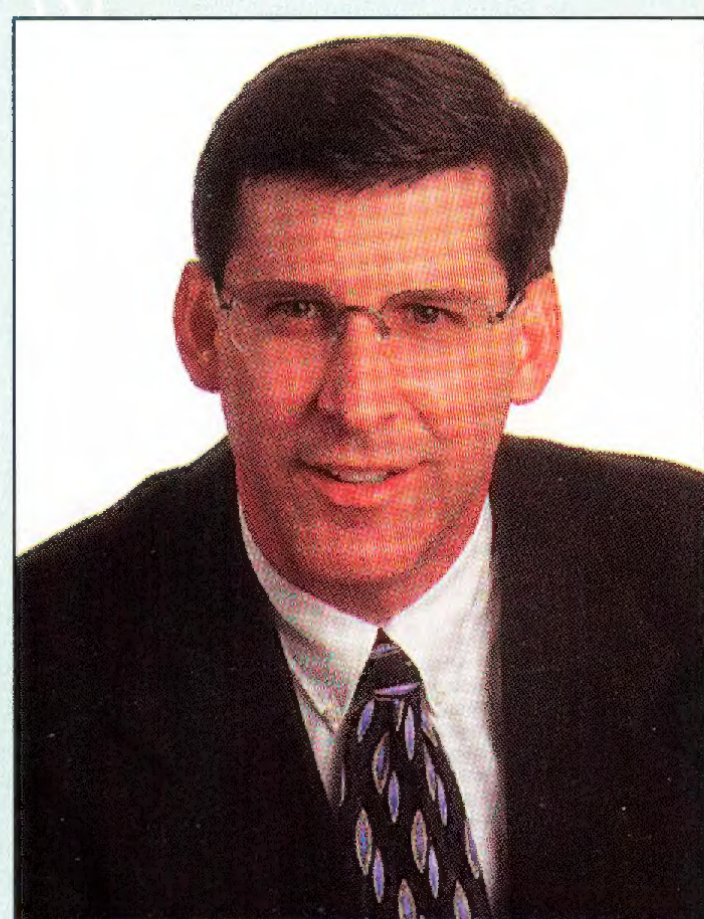


PHOTO: DONG LIN

Dr. Patrick Kociolek

and we intend to ask you for your opinion of our programs and facilities." To that end, we are convening focus groups in which we will interview our members to better

understand both what you like about the Academy and where you would like to see us change.

The 18-month process upon which we have embarked is a fascinating and important one. We are studying every aspect of this institution: programs, exhibits, research, facilities, amenities and many other aspects of the Academy. And we are studying how other institutions are planning for the 21st century. What we keep coming back to, though, as we dig deeper towards fully understanding the Academy's needs and potential, is how very important our members are. Your views, experiences, observations, and needs are crucial to how we prepare ourselves for the future. The Academy does an excellent job of addressing the current needs and demands of science education and research. But we can, and will, do more. We look forward to hearing from you about your ideas, thoughts and dreams for the Academy in the 21st century.

Please see a description on page six that will let you know about the dates and times for the members' focus groups. I look forward to seeing you there. Your participation is vital to the future of this institution. In advance of that participation, you have my thanks.

New Lindsay Chair of Botany Endowed

The California Academy of Sciences is delighted to announce a gift of \$2,000,000 from the Lakeside Foundation of San Francisco, endowing the Lindsay Chair of Botany. The gift honors Dr. George E. Lindsay and his late wife Geraldine (Gerry) Kendrick Lindsay.

Born in 1916, renowned botanist Dr. George Lindsay was the Executive Director of the Academy from 1963 to 1982. Great advances in the health of the institution and significant strides in scientific discovery were made during Dr. Lindsay's tenure. They included the revitalization of the Department of Anthropology, which had been largely inactive since the collections were mostly destroyed in the 1906 earthquake. George Lindsay has continued his internationally recognized botany research, and remains an active supporter of the Academy. The late Gerry Lindsay is fondly remembered at the Academy. She was founding chair of the important Docent Council that oversees the training and management of our valuable docent volunteers.

Proceeds from this major gift by the Lakeside Foundation will ensure that the strong scientific legacy of George Lindsay will continue at the Academy for generations to come. The Academy is deeply grateful for this gift.

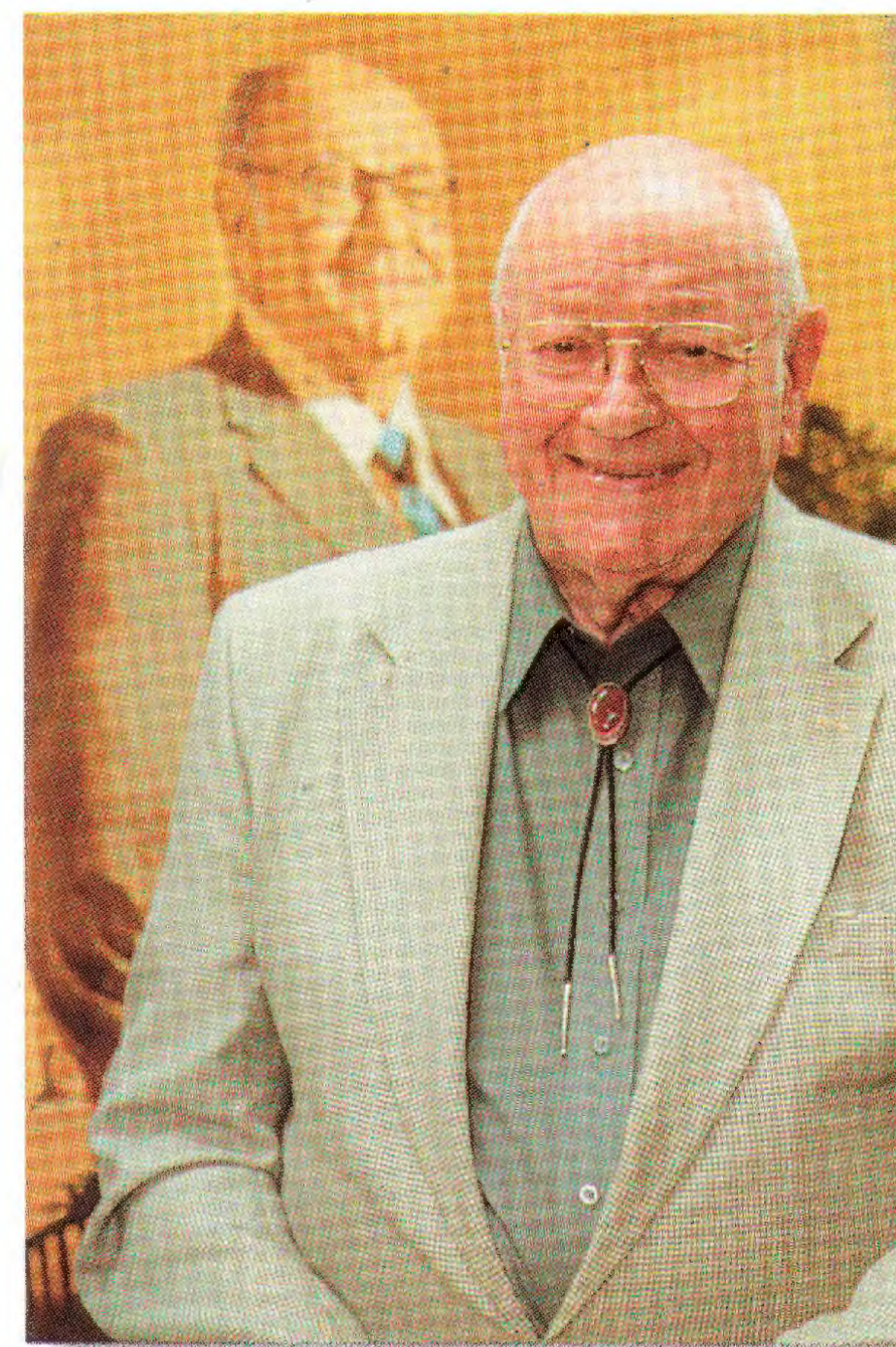


PHOTO: DONG LIN

Dr. George Lindsay

Changing Traditions: The Elkus Collection of Native American Arts

Opens Spring 1999

Changing Traditions will showcase several hundred examples of textiles, pottery, jewelry, paintings, baskets, and other items, dating from the late 1800s to the 1960s. The primary emphasis will be upon the Navajo and Pueblo peoples, but cultures from California, Alaska, and other regions will also be represented.

These items are all part of the Elkus Collection, assembled by San Francisco residents Ruth and Charles de Young Elkus, and bequeathed to the Academy in 1972.



Red Birds, Pablita Velarde

621
622
Feb/Mar '99

California Academy of Sciences Celebrates Black History Month and Chinese New Year

The California Academy of Sciences is proud to announce that the month of February will be filled with exciting and educational events in honor of two important celebrations: Chinese New Year (February 16) and Black History Month.

The Academy of Sciences is committed to heightening public awareness of the African American experience particularly with regard to science.

By building a community program that recognizes black achievements and traditions, the Academy hopes to encourage young African American

students to continue exploring the sciences and honor the pioneers who have triumphantly paved the way for others to follow.

This year, a special evening program highlighting a variety of music and dance forms of African heritage will be held on Wednesday, February 3, free day at the Academy of Sciences. Performance groups include the *a capella* group Motherstone, the Harambee Dance Ensemble, and the Hedzoleh Soundz band. There will be an afternoon showing of ethnographic films focusing on African American heritage and an additional afternoon of dance and musical performances. The Academy will also host a *Young Audiences*



PHOTO: JIM BLOCK

Melody of China

performance that brings to life ancient African traditions brought to Cuba during the slave trade (please see page 11 for more details).

San Francisco boasts one of the most extravagant celebrations of Chinese New Year in the United States, with one-third of the city population representing Asian communities.

Chinese New Year is one of the most important

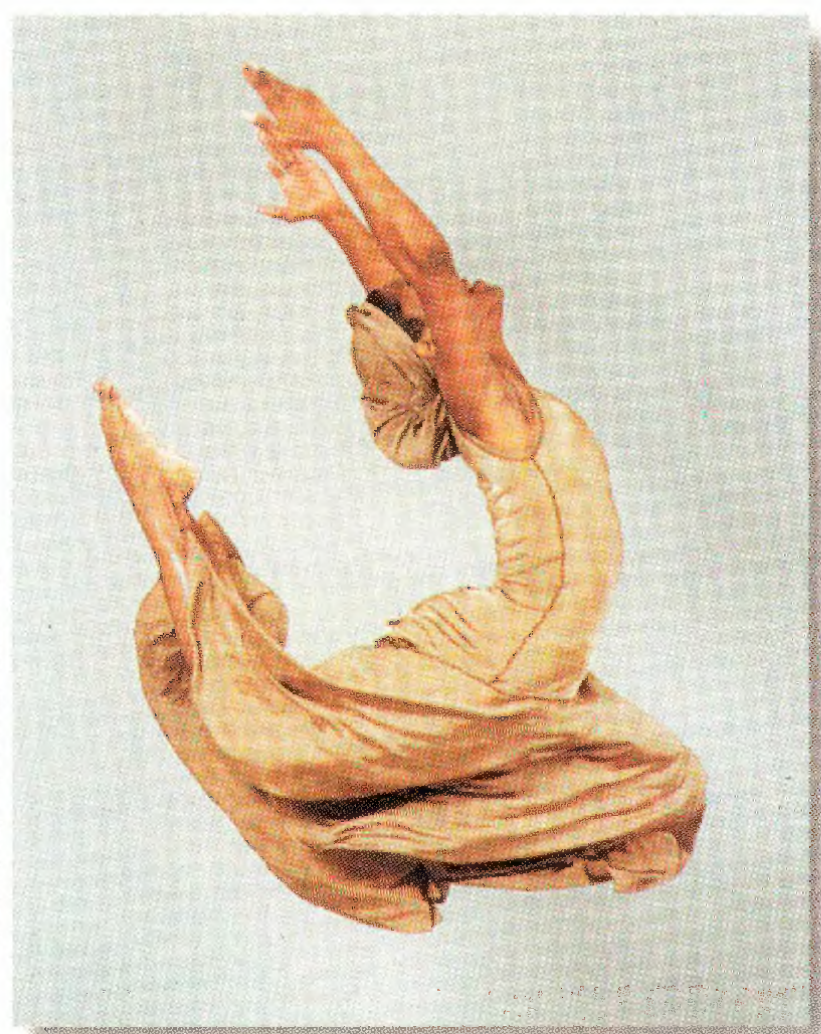


PHOTO: EMANUEL NADO

Dimensions Dance Theater

holidays to many individuals of Asian descent and the Academy is eagerly anticipating celebrating the colorful festive traditions. The programs planned at the Academy highlight ancient Chinese customs and art forms including a performance using Chinese folk instruments, demonstrations of brush painting, stone seal carving, and Tai-Chi, the ancient martial art form (please see page 11 for more details).

Come Hang with Bats

Masters of the Nights: The True Story of Bats

February 13, 1999 - May 2, 1999

Live Guests Make a Special Appearance

March 20, 27, April 10, 2:30 p.m.

Often associated with vampires and caves, bats have a bad rap. Few people understand that these unsightly creatures are actually beneficial to humans. *Masters of the Night: The True Story of Bats* dispels some of the myths surrounding bats, describes their ecological importance, and offers a fun, interactive learning environment that allows kids and adults to see the world from a bat's point of view.

Some visitors to Bats may feel like they are on the set of a horror movie as they enter the exhibit through a gargoyle flanked neo-Gothic castle with spooky organ music playing in the background. Once inside, mythic representations of bats spanning centuries and cultures are visible from the perspective of a bat—upside down. An interactive cave provides children with an opportunity to learn about roosting bats, conservation, habitats and hibernation. Children can crawl through the cave

or hang like a bat. An interactive rain forest provides a realistic look at bat habitats, echolocation, pollination, diet, and flight.

Visitors can experience

hearing the way a

bat hears using giant bat ears nearly twenty times their actual size. Additional displays include a baby bat nursery, bat portrait photography, and a recreated curator's office filled with specimens, models of oversized bat heads, bones, and comparisons of bat and human anatomies.

The exhibit demonstrates that bats really can see, do not get caught in hair, and do not catch criminals. However they do catch bugs—a little brown bat can catch 1,200 mosquito-sized insects in just one hour.

Do not miss the chance to explore these winged wonders live during springbreak (please see page 11 for details).



CALIFORNIA
ACADEMY OF SCIENCES

JAN 20 1999

On Our Cover

Flying Fox Bats (*Pteropus edulis*) from Breiten
Thierleben, in Special Collections/CAS Library. The
CAS Library is open to the public.

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The Academy's Yunnan Expedition

Bruce Bartholomew
Senior Collections Manager, Botany Department

About two years ago the Academy was approached by the Yunnan Provincial Commission on Science and Technology with a proposal to undertake a joint biodiversity inventory project in Yunnan, China. During the course of our discussions we considered a number of possible joint projects and eventually decided on a survey of the Gaoligong Shan region in extreme western Yunnan. The proposal that we worked out was to undertake a pilot project involving the Academy and the Kunming institutes of botany and zoology. These two institutes are part of the Chinese Academy of Sciences which has research institutes at various centers around China that cover the whole range of scientific fields.

Gaoligong Shan is a narrow mountain range that extends about 300 miles north-south but is only about 6 to 12 miles wide. It forms the divide between two of the major rivers in Asia with the Salween (Nujiang) to the east and the Irrawadi to the west. Most of Gaoligong Shan is now a preserve with the recently established Nujiang Nature Reserve (1450 sq. mi.) in the north and the older Gaoligong Nature Reserve (479 sq. mi.) in the south.

There are many reasons why Gaoligong Shan is an excellent area for undertaking an interdisciplinary, inter-

institutional biodiversity inventory project. There are extensive areas of relatively intact forest at least at the higher elevations. Because of the large north-south extent of the range there are clinal differences from one end of the range to the other. The whole area is in a biological transition area between the eastern



Osbeckia sp.

Himalayas and China and between the tropics and the temperate and has been identified as one of the centers of high biodiversity in China. The area is not well collected, particularly for many animal groups, but there is already the beginning of an inventory project for plants, so our project will help the Chinese scientists with research that is of interest to them.

We decided we would start with a single expedition. If the expedition was successful and we decided that we should continue with this collaboration, we would strive to develop a long-term cooperative project. The Academy sent four

participants on this expedition including David Kavanaugh (entomologist), Charles Griswold (arachnologist), Carl Ferraris (ichthyologist), and me (botanist).

The starting point for our expedition was Kunming, the capital of Yunnan Province where we arrived on October 5th. From here it was a two-day drive to the Salween River



Yunnan Expedition Team

that flows along the base of the eastern slope of Gaoligong Shan. Here the actual collecting portion of the expedition began. We split into two groups during most of the expedition. This was necessary because of the diverse types of organisms we were trying to collect, and the interest of the Chinese zoologists along with us who worked on groups including amphibians, birds, mammals, and reptiles. Each organism required different techniques and necessitated sampling habitats in different ways.

There were four major areas where we collected: from the Salween River at the small city of Liuku across Gaoligong Shan to the border town of Pianma and north along the Myanmar border to Gangfang; the area along the east slope of Gaoligong Shan to the south of Liuku; north of Tengchong on the east side of Gaoligong Shan; and near the top and on the western slope of the Gaoligong Shan near Nankang and Daheping.

In order to collect fish, Carl needed to spend his collecting time along streams and small rivers at the base of Gaoligong Shan rather than on the steep slopes and ridges. Dave and Charles needed to stay for extended periods in primary forest where they could collect insects and spiders at night and could survey a relatively small area for an extended period. For botanical specimens, I needed to sample as many different habitats as possible but not stay as long in any one area.

The immediate results of our pilot project were the specimens we collected. These will not only add many taxa to the collections at the Academy but will help in the efforts to develop a biological inventory of Gaoligong Shan. We hope that this will be just the beginning of a longstanding joint project.

New and Renewing Donor Circle Members

September and October 1998: \$125 to \$999

Donor Circle membership contributions support the Academy and significantly advance our work in research and education. It is with great pleasure that we gratefully acknowledge these gifts.

Ms. Gayle A. Anderson	Ms. Jennifer E. Lively &
Ms. Anna M. Bagliewska	Mr. Eric Edmondson
Mr. and Mrs. James Barbour	Mr. and Mrs. Charles K. Long
Mr. Eric Barkan	Mr. and Mrs. Tom Mann
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Mr. Michael Lazarus &	
Ms. Laura Kline	

The Academy Celebrates National Philanthropy Day

Created by an act of Congress in 1986, National Philanthropy Day pays tribute to the millions of Americans who make our nation's not-for-profit community the strongest and most successful in the world. Over the last year, the Academy has received outstanding support from many individuals, foundations, and corporations. A few of our dedicated donors were honored at a luncheon on November 13, 1998 at the Fairmont Hotel sponsored by the National Society of Fund Raising Executives.

The individuals honored by the Academy included Carol Casey, Lyman Casey, Arline Day, Thomas Day, Richard Lazarus, Wendy Parkin, and Rudolph Peterson. Jack Moehle from Pacific Earthquake Engineering Research Center, Woody Savage from PG&E, Susan Bolles from Pfizer Corporation and Mario Diaz from Wells Fargo Foundation also attended. Oracle Corporation, represented by Rosalie Gann, was the Academy's special honoree. Public awards were given to three individuals who have made many major contributions to the Academy and the San Francisco Bay Area over the years. The Lifetime Achievement Award was given to Phyllis Wattis, and Barbro and Bernard Osher were given the Outstanding Philanthropist Award.

Amazin' Microbes! Party

Over 700 guests attended the Academy's 1998 Halloween Party, *Amazin' Microbes! It's Halloween!* on Friday, October 30. Kids of all ages and their families came out to enjoy fun games, great exhibits, and delicious food by McCall Associates. Our scientists displayed their spookiest specimens, and Academy interns were ready with face and pumpkin painting, go-fish, microbe tastings, and more. This year's event was centered around the recent exhibit, *Microbes: Invisible Invaders... Amazing Allies*. The annual Halloween Party raises funds for Academy research and education programs.



Checking out the microscopic world

PHOTO: CHARLOTTE FIORITO

February

Beyond Reason:
Pseudoscience in America

with Jere H. Lipps, Ph.D.,
Professor of Integrative Biology, UC Berkeley

Dr. Lipps tells us that 95% of adult Americans are scientifically illiterate, meaning that over 196 million Americans do not understand how science is done or how to evaluate scientific results. The biggest offender in keeping us illiterate: television. On the other hand, television is our greatest hope!

Dr. Lipps's talk will emphasize the importance of science in everyone's daily life, the nearly complete lack of good science on commercial television, and what we can do about it.

Jere H. Lipps is Professor of Integrative Biology at the University of California, Berkeley, and a long-time Fellow of the Academy. His boyhood interests in science were stimulated by visits to the Academy many years ago. He is a geologist, paleontologist, and marine biologist, studying evolutionary phenomena in the aquatic biosphere from over a half billion years ago to the present, at sites from Antarctica, through the tropics, to Siberia.

February 10, 2 pm & 7:30 pm, Morrison Auditorium

Involving You — Our Members

In the last issue of the Academy Newsletter, you may have read Executive Director Patrick Kociolek's message about involving members in focus groups to help us understand the needs, limitations and potentials of the Academy.

Dr. Kociolek is interested in your opinion about who our audience is, why people come to the Academy, what is best about the Academy and where we could improve.

If you're interested in becoming part of these stimulating conversations, please take a look at the scheduled sessions, and give me a call to sign up. I look forward to hearing from many of you soon. Light refreshments will be served.

February 16 & 18 1-3 pm & 6:30-8:30 pm

February 23 & 25 4-6 pm

Membership Office, Sherry K. Bridgman, (415) 750-7112

March

The Search for the Giant Squid

with Richard Ellis, marine artist and author

You won't want to miss this intriguing lecture with Richard Ellis about his research of *Architeuthis* (pronounced Ark-i-tooth-iss), the scientific name for the giant squid.

Ellis tells us that no one has ever seen a living, healthy giant squid. The creature inhabits the deep ocean, surfacing only when dead or dying. It lives in total darkness, where the water is icy cold, under the pressure of thousands of feet of ocean water.

The giant squid, which can grow to a length of 60 feet, is

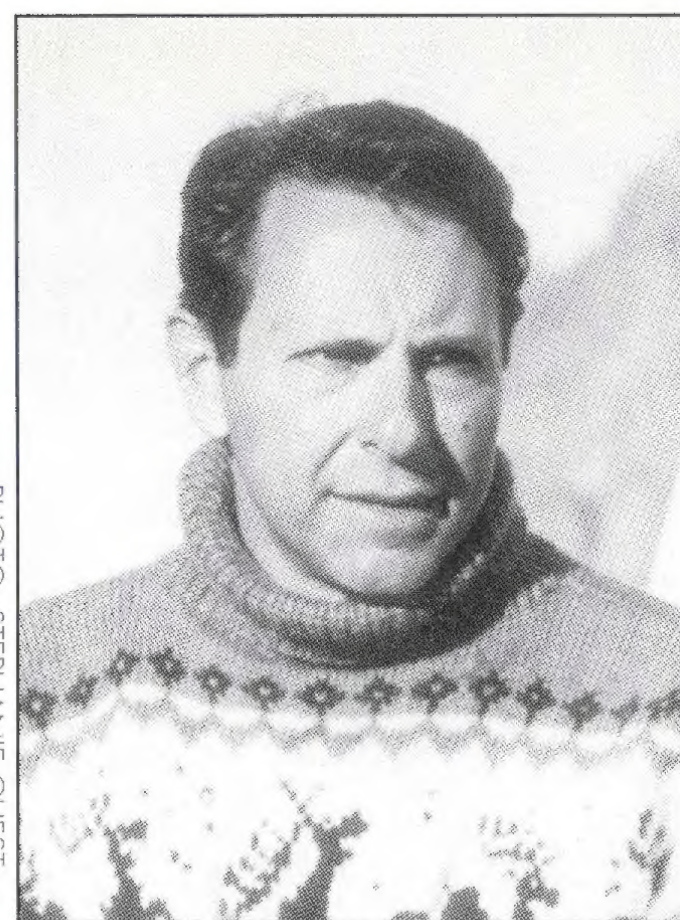


PHOTO: STEPHANIE GUEST

Richard Ellis

one of the largest animals on earth, but we know next to nothing about it — not its breeding or hunting habits, or its lifespan, or even its geographical distribution.

Immediately following the lecture Ellis will be available to sign his book, *The Search for the Giant Squid*, an authoritative look at the biology and mythology of the world's most elusive sea creature. The book

is available in the Academy book store for \$35, less your membership discount.

March 10, 1999

2 pm & 7:30 pm Morrison Auditorium

Many thanks to the following members who have increased their support of the Academy and its Annual Fund in the last two months:

Mr. Robert G. Adams
Mr. & Mrs. Alan J. Adler
David & Deborah Ballati
Dr. & Mrs. Ralph Benard
Ms. Kerry Blacker
& Mr. John Murnane
Mr. Johnson Bogart
Mr. Carl Brown, Jr.
David Brownstein
& Grace Shohet
Ms. Honor Bulkley
Mr. & Mrs. Robert Burke
Barbara & Chris Edwards
Mr. Robert Fordham
Mrs. Hanna Fromm
Mr. V. P. Gianella
Irina & Martin Heirakuji
Mr. Dan Holtman
Dr. Stephen Hufford

& Ms. Gretchen Frantz
Mr. & Mrs. Richard Johnson, II
Caroline & Mircea Kindrish
Chris & Stan Mattison
Dr. & Mrs. Henry Mally
Dan McDonald
& Martha Ryan
Mr. Robert McIntyre
Dr. & Mrs. Gene Shafton
Georgia A. Stapleton
Dr. Kelly Stewart
& Dr. Sandy Harcourt
Mr. Glenn Snyder
& Ms. Catherine Allman
Mr. & Mrs. John Taylor
Barbara Vaughan
Dr. Arne Wagner
& Dr. Gail Wagner

Making the Most of Your Support

Did you know that if you increase your unrestricted contribution to the Academy or make a gift above your membership dues before July 1, 1999, the increase will be matched, dollar for dollar, by our \$120,000 Challenge Grant?

The additional \$240,000 raised by the Challenge match will sustain programs in education, the Natural History Museum, the Planetarium, the Aquarium, and research. Please consider being part of this important funding opportunity when it comes time to renew your support of the Academy. Your extra support makes a difference. Many thanks!

Benjamin Dean Lectures

Spring 1999 Benjamin Dean Lectures in the Morrison Planetarium,
Tuesdays at 7:30 pm, \$3.00 each

February 16 — Dr. Sandra Faber

March 9 — Dr. Charles H. Townes

April 13 — Dr. Dale Cruikshank

May 11 — Dr. Carl Heiles

Information Hotline: (415) 750-7141

Reports from Academy Fellows

Audiences at the Spring 1999 Benjamin Dean Lecture Series will have an opportunity to meet four of the Fellows of the California Academy of Sciences. The Fellows are the governing body of eminent scientists and trustees whose predecessors founded the institution 146 years ago. These individuals represent the full range of disciplines within the natural sciences, and are nominated by their colleagues and appointed by the Board of Trustees in recognition of their contribution to the growth of scientific knowledge. The Dean Lecture Series is pleased to present Fellows actively doing research in the field of astronomy.

Images from the Hubble Space Telescope: Delight at the End of the Tunnel

Dr. Sandra Faber, UC Santa Cruz/Lick Observatory



Dr. Sandra Faber

Fellow Dr. Sandra Faber's research interests include galaxy formation, the large-scale distribution of galaxies in the universe, and the early evolution of the universe. She helped develop the currently accepted theory of galaxy formation based on gravitational growth of tiny ripples in space-time generated during the Big Bang.

Since 1985 Dr. Faber has been involved in building, testing and observing with the Hubble Space Telescope (HST). The HST began its career as an icon of the risk and failure associated with "Big Science." The tenacity and imagination of hundreds of people brought the telescope back from the brink of disaster to enormous triumphs. Dr. Faber will tour the universe through some of the most notable and beautiful images from the HST.

February 16, Tuesday

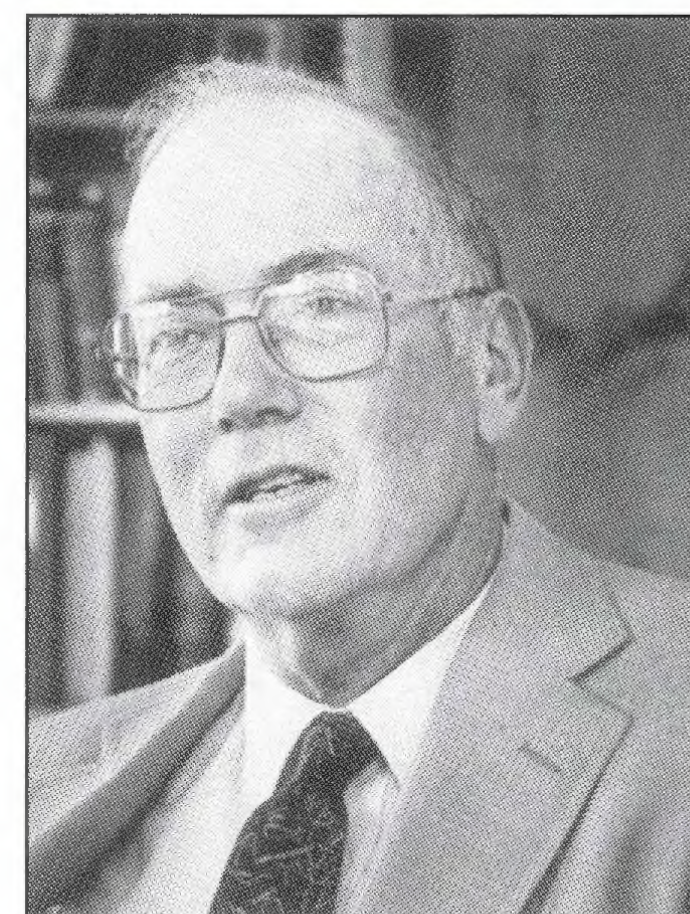
What's Going on in the Center of Our Galaxy?

Dr. Charles H. Townes, UC Berkeley

Dr. Townes is a Nobel Prize winner for his role in the invention of the maser and the laser. His principal scientific work has been in microwave spectroscopy, nuclear and molecular structure, quantum electronics, and currently, radio and infrared astronomy.

The center of our Milky Way Galaxy has long been an enigma. Now astronomers are discovering the galaxy's center is an area of great, complex activity. Peculiar new stars, ionized gas clouds, and an enormous black hole that doesn't behave according to predictions are some of the puzzles being encountered. Dr. Townes will describe recent data and discuss current interpretations and implications of their findings.

March 9, Tuesday



Dr. Charles Townes

Conversations at the Herbst

City Arts & Lectures, Inc. presents
CALIFORNIA ACADEMY OF SCIENCES
Conversations at the Herbst Theatre 1999

All Programs at 8:00 pm

The Annual Claire Matzger Lilienthal
Distinguished Lecture

Monday February 15 Laurie Garrett
Science Correspondence, Health Writer,
Newsday
The Coming Plague
In conversation with Roy Eisenhardt

Thursday March 11 Richard Dawkins
Scientist, Darwinist
*Unweaving the Rainbow – Science, Delusion,
and the Appetite for Wonder*
In conversation with Samuel M. Taylor

Monday May 3 Peter Matthiessen
Writer, Explorer
The Snow Leopard, Bone by Bone
In conversation with Samuel M. Taylor

Monday May 17 Donald & Lillian Stokes
Nature Authors, Bird Experts
Stokes Field Guide to Birds
"Birding: A Vision for the Future"
slide presentation

Tuesday June 1 Diane Ackerman
Naturalist, Poet
A Natural History of the Senses, Deep Play
In conversation with Samuel M. Taylor

*This series is made possible, in part, by a grant from
the Richard and Rhoda Goldman Fund*

*To order tickets, please call City Box Office at
(415) 392-4400.*

**California Academy of Sciences does not process
ticket orders for these lectures.**

The L.S.B. Leakey Foundation and California Academy of Sciences Present: Language and Human Evolution

Matt Cartmill

The ability to speak is uniquely human. Although some other animals (including apes, dolphins, and parrots) show surprising capacities for picking up bits and pieces of our symbol systems, they have no language systems of their own. Conversely, everything else that is uniquely human appears to be grounded in language. Yet, human language has left no clear evolutionary trail. In this lecture, Cartmill looks at the anatomical underpinnings of language, weighs the evidence for language origins that scientists have tried to gather from bones and artifacts, and reviews recent models of prehistoric language derived from studies of living apes and humans. He shares new, unpublished data on the evolution of the nerves to the muscles in the tongue and reevaluates current theories about human evolution in light of these findings.

February 18 (Thursday), 7:00 pm

This lecture is preceded by a cocktail reception at 6:00 pm.

Lecture only: \$6 members/\$10 non-members

Lecture and reception: \$36 members/\$45 non-members

The Wildlife Talks

*Sponsored by Wildlife Conservation Society and
California Academy of Sciences.*

The Wildlife Talks feature research scientists from Wildlife Conservation Society and California Academy of Sciences who are making significant contributions to national and international scientific research. The speakers demonstrate how the collection of scientific data in the field contributes to resource management decisions worldwide. All programs begin at 7:30 pm in the Morrison Auditorium, California Academy of Sciences. A cocktail reception from 6:30 – 7:30 pm precedes each presentation.

Stalking the Greater Yellowstone Ecosystem: Rubbing the Lynx the Right Way

John Weaver

Understanding the role that the lynx, *Lynx canadensis*, plays in the forest ecosystem was nearly impossible until now. The presence of this highly elusive cat in the northeastern and northwestern forests of the United States is difficult to verify due to its nocturnal, solitary lifestyle and rapidly declining numbers. Scientists find it nearly impossible to spot the lynx with conventional assessment methods and therefore have been unable to gain an accurate census of these animals to assess their survival or advise in their recovery. In this lecture, John Weaver reveals the new, non-intrusive and effective technique he developed to survey this elusive cat. Based on the cat's natural inclination to rub against sharp objects, Weaver uses a grid of catnip scented rubbing posts to snag hair from the lynx or any other cat that may be in the area.



PHOTO: GERALD & BUFF CORSI

lynx, *Lynx canadensis*

DNA analysis is then used to identify the species and individual. Assessing the presence or absence of these top predators helps forecast the health of the forest ecosystem overall and will determine future recovery plans.

February 4, Thursday

Upcoming Talks:

Basic Faunal Inventories: Prerequisites for Conservation in Madagascar

with Dave Kavanaugh

April 22

Saving Wild Animals, Veterinary Medicine in the Field

with William Karesh

June 10

Wildlife Talks Pricing

Lectures Only:

Members: \$6 per lecture/\$12 for series of three

Non-Members: \$10 per lecture/\$20 for series of three

Lectures and Receptions

Members: \$36 per lecture/reception/\$75 for series of three

Non-Members: \$45 per lecture/reception/\$110 for series of three

Downtown Lecture Series

- *The Downtown Lecture Series features regional scientists who are making significant contributions to their fields of study.*
- *Lectures take place on Friday evenings at San Francisco State University's Downtown Center located at 425 Market Street (at Fremont). Ample parking is available below the building, and the Embarcadero and Montgomery BART stations are close by.*
- *All lectures start promptly at 5:45 pm.*

Biodiversity of the San Francisco Bay Area

The San Francisco Bay Area is rich in biological diversity. From the intertidal invertebrates to the soaring birds of prey, join us as we explore, celebrate, and conserve the diversity of life in the Bay Area.

Biodiversity of the Farallon Islands

Ed Ueber



PHOTO: LLOYD UEBER

Farallon Island Rookery

The Farallones are a wilderness at the twenty-six nautical crossroads to the Golden Gate. The richest breeding seabird colony in the continental United States is located there, and the most heavily fished waters on the west coast encircle the island. The islands anchor California's most diverse marine algae community and support thirty-three species of marine mammals. The islands are the epitome of biodiversity! Join Ed Ueber, manager of the Gulf of the Farallones, Cordell Bank and co-manager of the Monterey Bay National Marine Sanctuary, to get an insider's view on this magical place in our own back yard.

February 19 (Friday)

When Raptors Don't Read the Rules—Fifteen Years of Counting, Banding, and Tracking Birds of Prey at the Golden Gate

Allen Fish

Each autumn, tens of thousands of birds of prey, representing nineteen species, fly past the Marin Headlands in Golden

Gate National Recreation Area, comprising the largest known raptor migration bottleneck in the western United States. Since 1983, volunteers at the Golden Gate Raptor Observatory have studied this migration using counting, banding, and radio-telemetry techniques. And since 1983, the raptors have continued to baffle scientists, forcing them to create new hypotheses about why autumn raptors migrate in California at all. Join Allen Fish of the Golden Gate Raptor Observatory to learn more about this incredible spectacle that takes place each fall and to discuss the latest research.

February 26 (Friday)

Biodiversity and Human Impact on Intertidal Life

Bob Breen

The rocky shores along the Pacific coast offer a marvelous glimpse into the wonders of undersea life. Learn about the biology and ecology of local rocky intertidal organisms living along this ribbon between the land and sea. Discuss how this shallow-water web of life hangs in delicate balance due to human impacts, and look at resource management strategies developed to conserve these precious ecosystems.

March 5 (Friday)

Sharks of San Francisco Bay

John McCosker

The Bay Area is rich in sharks and shark lore. Besides the great white shark, sixteen other species, as well as numerous skates and rays, ply our waters. The Tiburon Peninsula was named for its abundance of sharks, and our infamous "red triangle" has had more white shark attacks upon humans than any similar coastal region. A major Bay Area sports team has even adopted one of these marvelous creatures as its mascot. Learn shark facts, shark lore and mythology, and a guaranteed means of avoiding shark attacks from John McCosker.

March 12 (Friday)

Invasive Species and San Francisco Bay

Jan Thompson

Loss of habitat and the introduction of non-native species are major forces reducing species diversity in many ecosystems. The estuarine system of San Francisco Bay has a long history of introduced species. Jan Thompson of the United States Geological Survey discusses the history of introduced species in San Francisco Bay, the economic and ecosystem effects of these introductions, and gives a case history of one species recently introduced into the Bay. Learn how one species is capable of changing an entire food web and the ways in which contaminants flow through the ecosystem.

March 19 (Friday)

Members: \$10/lecture \$45/series of five
Non-members: \$12/lecture \$55/series of five

Adult Education

Earth's Nearest Neighbors: The Geology of Mars, Venus, and the Moon

Scott Hassler

Amateur astronomers can easily catch views of Mars, Venus, and the Moon at various times during the year and, depending on conditions, are able to see a high degree of detail on each. This course is an opportunity to learn more about the geology of Earth's companion planets and the Moon. An introduction to the origin of the solar system and an overview of terrestrial geology form a basis for comparison in this planetary geology class. Focus on evidence for varied levels of tectonic activity and surface processes, as well as planetary histories.

February 24, March 3 and 10 (3 Wednesdays)

7:00 – 9:00 pm

\$35 members/\$40 non-members

Iroquois Masks

Carol Morrison

In the great forests of the Northeast, two powerful masking traditions enriched the spiritual landscape of Iroquois Indians. Different groups had the right to wear specific masks and to perform associated rituals that addressed the spiritual and practical needs of their culture. The False Faces brought psychic healing and purification; the Bushyheads mediated between farmers and their crops. Carol Morrison sets the cultural stage of life as it was at the height of the masking tradition and relates the artistic forms of the Iroquois masks to the stories and rituals that brought them to life. Contemporary Iroquois concerns and activities are explored by way of the Internet. The last portion of each session features a workshop for those interested in learning the technique of making corn husk masks.

February 25, March 4, 11, 18 (4 Thursdays)

7:00 – 9:30 pm

\$55 members/\$65 non-members

Assembling California

Terry Wright

Lecture and Field Trip

Large and small tectonic plates make up the Earth's crust, moving across the planet in different directions and at various speeds. Using John McPhee's popular book *Assembling California* as the basis of discussion in this class, study the geology of California as it relates to the collision and rearrangement of these land masses eons ago. A field trip to sites in the Marin Headlands, Mount Tamalpais, and Ring Mountain Preserve provides more in-depth insight into the geologic origins of Marin County. Field trip requires moderate hiking over rocky terrain.

Class: March 11 (Thursday), 7:00 – 9:30 pm

Field Trip: March 13 (Saturday), 9:00 am – 4:00 pm

\$35 members/\$40 non-members

Spring in the Mojave Desert

David Wimpfheimer

Overnight Trip

Desert. Just the word conjures up images of extremes. A barren wasteland. A carpet of wildflowers stretching to the horizon. Focus on the variety of life found in the desert and those adaptations that allow survival in a harsh landscape. Winter rains bring spectacular wildflower displays, and this year could be equally mesmerizing. Seek out desert species of birds, mammals, lizards, and snakes on this four-day adventure. Visit Joshua Tree National Park and other familiar sites in the Mojave Desert, and by special arrangement, gain access to limited access areas on Department of Defense land. Explore military bases such as



Cima Dome & Cactus, Mohave National Preserve

Twenty-nine Palms, Fort Erwin, and Edwards Air Force Base to see springs, archeological sites, and other unique areas usually off limits to the public. This four-day trip allows you to experience the desert at its most beautiful time of year!

Pre-trip Meeting: April 5 (Monday), 7:00 – 9:00 pm

Trip: April 10 – 13 (Saturday – Tuesday)

\$325 members/\$345 non-members, double occupancy

\$375 members/\$395 non-members, single occupancy

Includes lodging and continental breakfast. Does not include transportation. Please clearly indicate lodging preference on registration form. Trips to military bases are subject to change without notice.

Illustrating Bats in Gouache and Colored Pencil

Carolynne Griffin

A special exhibit at the Academy on bats is the focus for an in-depth look at these "masters of the night." Illustrate these interesting and often maligned creatures by sketching them from exhibit displays and illustrations. Using gouache and colored pencil on dark-toned paper, illustrate such diverse species as Leaf Nosed Bats, Flying Foxes, and Funnel Eared Bats. Open to beginning and experienced artists.

March 23 – April 13 (4 Tuesdays), 7:00 – 10:00 pm

\$95 members/\$105 non-members

Traditional Arts of the World

All programs take place at 1 pm on selected Saturdays. Presentations are free after general admission to the museum. For further information on these events and other Traditional Arts Programs, contact Almudena Ortiz at (415) 750-7165. The Traditional Arts Program is funded by the Paul L. and Phyllis Wattis Foundation.

February

Our programs this month honor Chinese New Year (February 16th) and Black History Month.

February 6 — Chinese Music

Wang Hong, a specialist in ancient Chinese folk instruments, plays the *erhu*, (two-stringed spiked fiddle), *dizhi* (bamboo flute), *xiao* (vertical flute), *sheng* (mouth organ), *bawu* (copper membrane flute) and *xun* (clay flute). Mr. Hong is accompanied by his ensemble Melody of China. (African Hall, 1 pm)

February 13 — Chinese Arts

Mr. Zhao Quan He, Mr. Huen Moon-Yan and members of the Chinese Arts Association of America present a day-long program of calligraphy, brush painting, and stone seal carving. (Cowell Hall, 10-5 pm)

February 20 — Tai-Chi

Master Zach Ma will introduce us to the ancient martial art of Tai-Chi, including the hand-form and sword-form. Audience participation is welcome. (Auditorium)

February 27 — African Music and Dance

A special afternoon program celebrating African heritage.

- 1:00 pm Diamano Coura Senegalese Dance Ensemble
- 2:00 pm The Gospel Elites
- 3:00 pm Dimensions Dance Theater

March

March 13 — American Ragtime Music

David Reffkin and The American Ragtime Ensemble will play popular dance and concert music of the turn of the century (1890-1920) including pieces by Scott Joplin. (Auditorium)

March 20 — Jewish Storytelling

Accompanied by music and puppets, storyteller and educator Mimi Greisman will tell the story of Purim (the victory of Mordechai and Esther over wicked Haman) celebrated this year on March 1-2. This program is especially suited for young children. (Auditorium)

March 27 — The History of Bagpipes

Musician and historian Sean Folsom will explain and demonstrate the differences between a variety of bagpipes, including instruments from Spain, Tunisia, Bulgaria, Turkey, Scotland and Italy among others. (Auditorium)

Public Programs

Roots of Africa

Special Evening Program

Performing arts groups from the Bay Area highlight a variety of music and dance forms of African heritage. The program starts at 6:00 pm in the auditorium, featuring the *a capella* group Motherstone, followed at 7:00 pm by the Harambee Dance Ensemble and culminating with a lively Dance Party in African Hall at 8:00 pm when everyone is invited to dance to the pulsating Ghanaian rhythms of the Hedzoleh Soundz band.

*February 3rd, Wednesday — Free Day, 6 pm (Auditorium)
Free Admission*

African-American Film Festival

An afternoon of ethnographic films focusing on African-American heritage.

February 28th, Sunday, 1–5 pm, Auditorium, Free Admission

The Amazing World of Bats

with Bob Benson

Bat Conservation International

In conjunction with *Masters of the Night*, the Academy's traveling exhibit on bats, Bob Benson, the Public Information Director at Bat Conservation International, will introduce the world of bats to Academy visitors. His lecture and slide presentation will take you deep into caverns, jungles and deserts. Designed for families, this presentation will take adults and children on a fascinating journey through the amazing adaptations and current threats to survival for this winged mammal.

This presentation is free with Academy admission and is open to all ages. For more information, please call (415) 750-7318.

February 27, Saturday, 11 am (Auditorium)

Special Guests to Visit *Masters of the Night*

Don't miss the rare opportunity to observe non-releasable bats up close and in person. Several species of local bats will be presented and discussed. Patricia Winters from the California Bat Conservation Society will share her knowledge gained from thirty years experience as a wildlife rehabilitator and educator. Her Chiropteran companions are native to this area and are powerful educators about the facts and myths surrounding this amazing mammal.

This presentation is free with Academy admission and is open to all ages. For more information, call (415) 750-7318.

March 20, March 27, & April 10, 2:30 pm (Auditorium)

Please note: the dates and times have changed from the last newsletter!

February – March Sky Show Schedule

Sky Show Weekday Weekend

February 1 – March 14, 1999

Weekend schedule applies on February 15.

Presidents Day

1999 Almanac 2pm 12 & 2pm
ending date: 3/14/99

Stardust 1 & 4pm
ending date: 6/13/99

The Sky Tonight 3:00pm
no ending date

Neighbors in Space 11:00am
no ending date

March 15-18, 1999

Closed for installation of "The Other Side of the Sky"

March 19-31, 1999

The Other Side of the Sky 2pm 12 & 2pm
ending date: 9/12/99

Stardust 1 & 4pm
ending date: 6/13/99

The Sky Tonight 3:00pm
no ending date

Neighbors in Space 11:00am
no ending date

Tickets can be purchased one half hour before the show (box office opens at 10:30am on weekends) at the box office once inside the Academy of Sciences (\$2.50 adults, \$1.25 seniors and children (6-17). Members must redeem their passes for tickets at the box office prior to the show. If you have a child under 6 years old with you please ask the cashier for a "Child's Pass". For more information, please call 750-7141.

Live Concert in the Planetarium

Ann Dyer, Dmitri Matheny, John Shifflet and Darryl Grant are joined by Steven Hill, host of radio's Music from the Hearts of Space, for a performance of *Equinox II: Music Inspired by the Cosmos* on Tuesday, March 23 at 8 pm. Tickets are \$12 for adults, \$10 for Academy members and \$8 for youth and seniors.

Advance tickets are available by sending a check payable to Morrison Planetarium, and a self-addressed stamped envelope to: Concerts, Morrison Planetarium, California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118. You may also purchase tickets at the door one half hour before the performance. For more information, call the Planetarium Office at (415)750-7127.

1999 Morrison Planetarium Sky Shows

Stardust

to June 13, 1999

Take a close look at some of the minor bodies orbiting our star—from particles of dust to rocky asteroids—and find out how some of the solar system's smallest members can have the greatest impact on us. How do we detect them, how do they affect us, and what do they tell us about the possibility of life elsewhere in the Universe?

1999 Almanac

to March 14, 1999

1999 has plenty in store for stargazers, including the last solar eclipse of the century, another opportunity for spectacular meteor showers, and two "blue moons." Find out what sky-watchers will be looking out for in 1999.

The Other Side of the Sky

premieres March 19, 1999

How do we learn so much about distant objects in space? Since most are too far away to study directly, astronomers use light and gravity to explore the universe. From the breakthroughs of the ancient astronomers to the wonders uncovered by modern telescopes, discover how scientists work to unlock the secrets of the universe.

Intern Update

by Julia Patsay, Level 1 Intern

Interns at the Academy do a wide variety of things, from explaining museum exhibits to the public to working as camp counselors with Camp Academy and even working with the scientists in various research departments. In time, some interns demonstrate an ability to take on more responsibilities. The Intern Program is a career ladder with four levels of responsibility, each one greater than the other. The first intern to move all the way up that ladder is Jamie Threat, who recently became a Level 4. Being a Level 4 means that Jamie designs curriculum for teaching science, trains and supervises other interns, and assists with the administration of the Intern Program. Congratulations, Jamie!



Intern Jamie Threat shares homology with the public at the demonstration station she created.

Summer Tales from the Junior Academy: Glorious Golden Gate Park

"Come on! Keep going! Pedal just a little bit harder! You can do it! Hold that plankton tow steady! We're almost there!"

Each Monday last summer, from mid-June to the end of August, Camp Academy leader Zakary Zide and his assistants urged on groups of intrepid young naturalists as they began their week-long exploration of San Francisco's most famous big backyard: Golden Gate Park.

Sometimes draped in summer fog, other times basking in bright sunshine, the week always began the same way: circling Stow Lake in paddle boats, dragging plankton tows, collecting plankton and analyzing the water quality. Close scrutiny under field microscopes revealed the diversity of life in the Park's ponds. Other days during the week, students



recorded bird songs and created sonograms, studied insects, collected butterflies, visited the Academy's entomology

collections, toured the Park's main greenhouses, and participated in an oak woodland restoration project with staff from the Park's Urban Forestry Division.

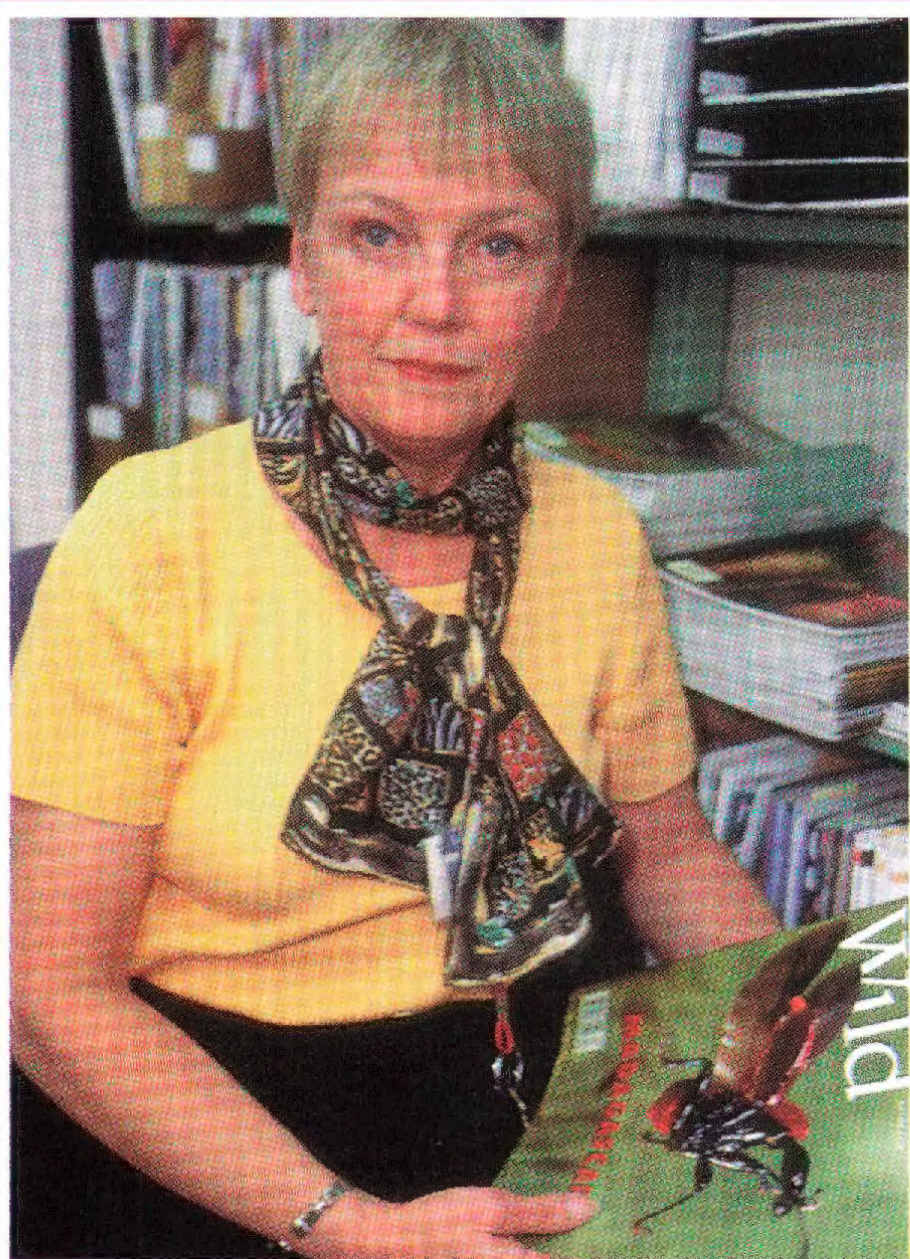
Funded in part by BankAmerica Foundation, Camp Academy teaches children about biodiversity science and conservation biology through field-based activities. Students 8-10 years of age signed up from the Junior Academy, from several San Francisco Recreation and Park Department Latchkey Sites, from the Whitney Young Child Development Center and the Summer Discovery Program.

To check on current class availability for spring classes, call the new hotline (415) 750-7575. For a course catalog, please call (415) 750-7100.



Zak Zide with students in the entomology department.

Outstanding Volunteer



Look at the masthead of *California Wild*, the Academy's quarterly magazine, and you'll find a listing for Editorial Assistants. All are volunteers, and one them, Sheri Landwehr, is the subject of this issue's feature.

Born in Ohio and raised in Florida, Sheri came to the Bay Area in 1966. After retiring from 30 years in customer service she was drawn to the Academy by an appeal for Star Trek volunteers, followed by tidepool touchtank service and docent touring. She offered to help in the *California Wild* office and soon became the publication's "gal Tuesday and Thursday," handling subscriptions, data entry, distributing back issues, ordering supplies, answering the phones, some correspondence and submitting material for copyright.

Sheri enjoys warm water diving and travel to "anywhere." She aspires to visit Cuba before it opens up to tourists, and says, "I guess I'm just one of those people who is curious about everything." We'll try to keep you occupied, Sheri, but it won't be easy. Thanks for all you do!

Order Form

YOUR NAME:

Address _____

City _____ State _____ Zip _____

Member # _____

ADULT EDUCATION

	Quantity/Members	Qty/Non-members	Total
Earth's Nearest Neighbors Feb. 24, March 3 and 10	____ X\$35	____ X\$40	= ____
Iroquois Masks Feb. 25, March 4, 11, 18	____ X\$55	____ X\$65	= ____
Assembling California March 11, Field Trip March 13	____ X\$35	____ X\$40	= ____
Spring in the Mojave Desert, April 10-13			
Double Occupancy	____ X\$325	____ X\$345	= ____
Single Occupancy	____ X\$375	____ X\$395	= ____
Illustrating Bats March 23-April 13	____ X\$95	____ X\$105	= ____

LECTURES

	Quantity/Members	Qty/Non-members	Total
Language and Human Evolution Lecture	____ X\$6	____ X\$10	= ____
Lecture and reception	____ X\$36	____ X\$45	= ____
Wildlife Talks/Rubbing the Lynx Lecture	____ X\$6	____ X\$10	= ____
Series of three lectures	____ X\$12	____ X\$20	= ____
Lecture and Reception	____ X\$36	____ X\$45	= ____
Series/three lectures and recept.	____ X\$75	____ X\$110	= ____
Downtown Lecture Series			
Biodiversity of the Farallon	____ X\$10	____ X\$12	= ____
Raptors/Counting. Banding	____ X\$10	____ X\$12	= ____
Biodiversity/Human Impact	____ X\$10	____ X\$12	= ____
Sharks of San Francisco Bay	____ X\$10	____ X\$12	= ____
Invasive Species	____ X\$10	____ X\$12	= ____
Series of five	____ X\$45	____ X\$55	= ____

B. DEAN LECTURES

	Quantity	Total
Images from the Hubble	____ X\$3	= ____
What's Going on in the Center of our Galaxy	____ X\$3	= ____

JUNIOR ACADEMY

Please call (415) 750-7100 for class catalog.

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- ☐ Please send me information about effective gift and personal planning in 1999.
- ☐ Please send me information about life income gifts and bequests to the Academy
- ☐ I have already provided for the Academy in my will or other estate plans.

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Academy Store

Lilly Stamets, the Academy Store Retail Operations Manager, will be traveling with Jean DeMouthe, Academy geologist, to the Tucson Gem and Mineral Show in mid-February to acquire rocks, minerals, fossils and gems for the Academy's geology collections and merchandise assortments for the Academy Store.

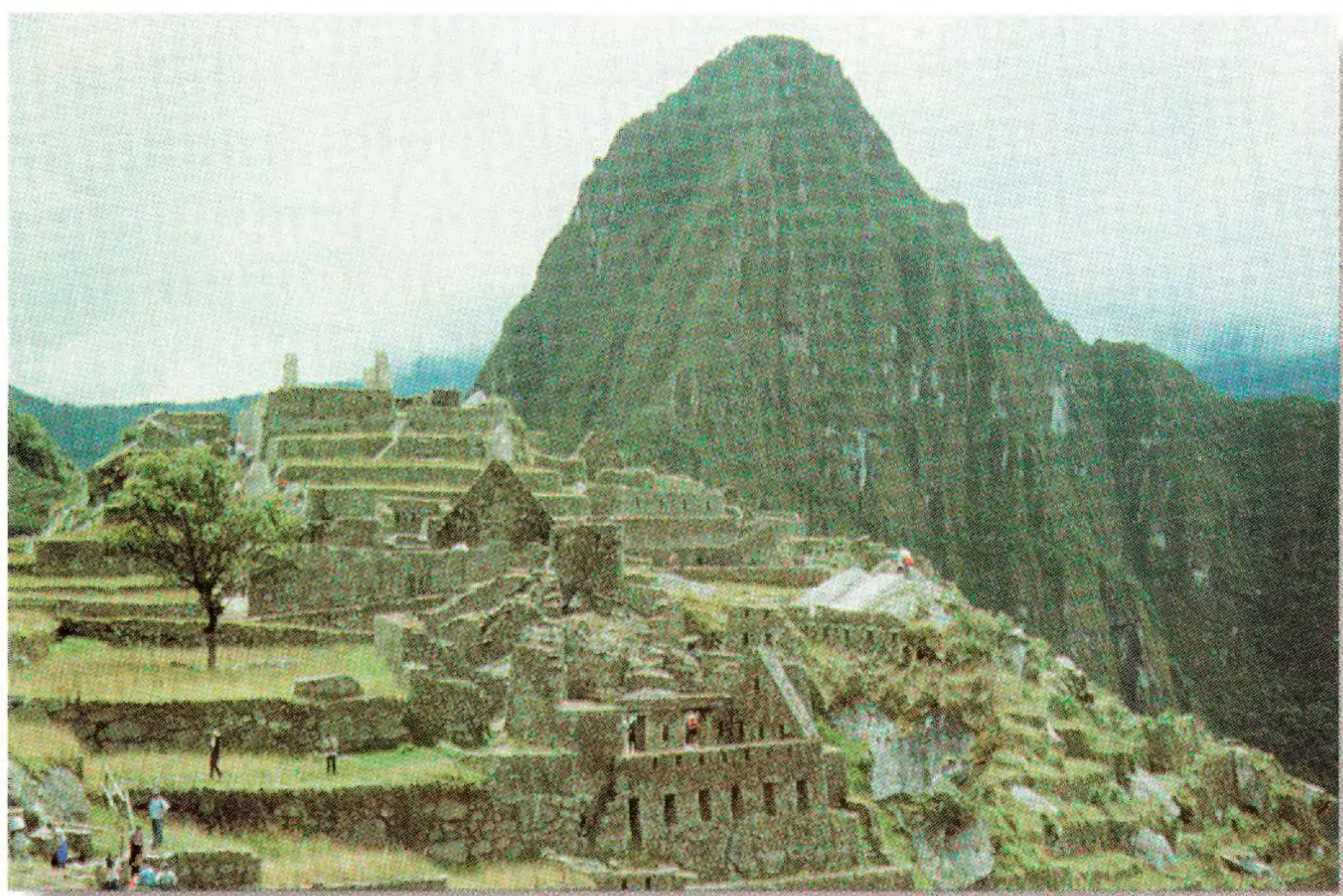
Come browse the latest finds from all corners of the Earth. Our collection of geologic specimens and jewelry will come from Kenya, China, Morocco, Brazil, Peru, Colombia, Dominican Republic and, of course, the United States.

You will find books and gifts that support and compliment the wonderful color palette of rocks and minerals that nature has to offer. A "natural" choice for all members is waiting for you in the Academy Store. Pricing will be from \$1.00 to \$1,000 for all your gift giving needs.

Peru (with optional extension to Machu Picchu)

with Dr. Doug Bell

June 9–18, 1999



Machu Picchu

On this exclusive tour you will journey up the Amazon River by covered longboats to *Posada Amazonas*, a beautiful lodge nestled in the rainforest. Here you may be fortunate enough to view the extremely rare Harpy Eagle. From there you will continue upriver to the Tambopata Research Center where you will learn firsthand about the macaw project and regional conservation efforts while enjoying the research center's rustic charms. At dawn, each morning, you will cross the river to watch as parrots and macaws socialize at the largest known clay lick in South America. There will also be treks through the rainforest to view the brilliant bird and animal life, and two days to explore cosmopolitan Lima.

Cost: Per person (based on double occupancy), \$4,295 including air

Barranca del Cobre Rail Journey through Mexico's Copper Canyon

with Dr. Tom Daniel

September 30 –
October 8, 1999

Mexico's magnificent *La Barranca del Cobre*—the Copper Canyon—is composed of six main gorges, dwarfing Arizona's Grand Canyon in size and offering some of the most stunning scenery in North America. Your nine-day journey will include three days of transportation on the *Chihuahua al Pacifico*



train, traveling in a deluxe restored vintage car through dramatic landscapes that include fir and pine forests in the rugged *Sierra Madre*, breathtaking canyon views, and changing landscapes as you descend to the desert-like cactus landscapes on the west side. Areas of this region are so rugged they have seldom been explored on foot, except perhaps by the Tarahumara Indians, who have been protected and nurtured by the canyons for over 500 years. Their homes are concealed in canyon walls and their ability to traverse this rugged terrain is legendary. Accommodations are comfortable hotels and lodges in keeping with the areas. The *Posada del Hidalgo* is a Spanish colonial mansion, and the *Posada Barrancas Mirador* is perched on the edge of the Urique Canyon, the deepest canyon in North America.

Cost: Per person (based on double occupancy) \$2,620 plus air

China Archaeology and Yangtse Cruise Tour

with Dr. Nina Jablonski

October 14–29, 1999

This exciting tour begins with 3 days to enjoy the wonders of Beijing. You will visit the Yonghegong Buddhist Lamasery and the Confucian temple, the Forbidden City, the Great Wall, the Temple of Heaven and the Summer Palace. A visit to the Peking University

Sackler Archaeology Museum will include a special tour guided by the museum director.

After a visit to the famous terracotta warriors at Xian you will board the M.S. YANGTSE VICTORIA (an American made and managed ship).

The main focus will be the extraordinary Three Gorges, the deep valleys and towering mountains carved by the Yangtse.

Each day will have special side trips off the boat, including

visits to the "city of devils" Fengdu, the small mountain village Wanxian, a ride up the tributary Shennongxi, the tomb of the poet Qu Yuan at Zigui, and the Gezhouba dam at Yichang.

Before your return to San Francisco, you will have one and a half days to visit the sites of Shanghai including the Jade Buddha Temple and the Shanghai Art and History Museum.

Cost: \$5,490 per person (based on double occupancy) including air



February

3 Wednesday

Roots of Africa
6 pm (Auditorium, p. 11)

4 Thursday

Rubbing the Lynx the Right Way
6:30 pm rec. 7:30 pm talk
(Wildlife Talks, p. 8)

6 Saturday

Chinese Music
1 pm (Trad. Arts p. 11)

10 Wednesday

Beyond Reason:
Pseudoscience in America
2 & 7:30 pm
(Members Meeting, p. 6)

13 Saturday

Masters of the Night: The True
Story of Bats opens
Chinese Arts
10 am-5 pm (Trad. Arts, p. 11)

15 Monday

Conversations at the Herbst
8 pm (p. 7)

16 Tuesday

Members Focus Group
1-3 pm & 6:30-8:30 pm (p. 6)
Images from the Hubble
Space Telescope
7:30 pm (B. Dean lecture, p. 7)

18 Thursday

Members Focus Group
1-3 pm & 6:30-8:30 pm (p. 6)
Language and Human
Evolution
6:00 pm rec. 7:00 pm lecture
(p. 8)

19 Friday

Biodiversity of the Farallon
Islands
5:45 (Downtown Lecture, p. 9)

20 Saturday

Tai Chi
1 pm (Trad. Arts, p. 11)

23 Tuesday

Members Focus Group
4-6 pm (p. 6)

24 Wednesday

Earth's Nearest Neighbors
7-9 pm (Adult Ed., p. 10)

25 Thursday

Members Focus Group
4-6 pm (p. 6)
Iroquois Masks
7-9:30 pm (Adult Ed., p. 10)

26 Friday

When Raptors Don't Read the
Rules
5:45 (Downtown Lecture, p. 9)

27 Saturday

African Music and Dance
1 pm (Trad. Arts, p. 11)
The Amazing World of Bats
11 am (Auditorium, p. 11)

28 Sunday

African-American Film Festival
1-5 pm (Auditorium, p. 11)

March

3 Wednesday

Earth's Nearest Neighbors
7-9 pm (Adult Ed., p. 10)

4 Thursday

Iroquois Masks, (see Feb 25)

5 Friday

Biodiversity and Human
Impact on Intertidal Life
5:45 (Downtown Lecture, p. 9)

9 Tuesday

What's Going on in the
Center of Our Galaxy?
7:30 pm (B. Dean lecture, p. 7)

10 Wednesday

The Search for Giant Squid
2 & 7:30 pm (Members
Meeting, p. 6)
Earth's Nearest Neighbors
7-9 pm (Adult Ed., p. 10)

11 Thursday

Iroquois Masks, (see Feb. 25)
Conversations at the Herbst
8 pm (p. 7)
Assembling California
7-9 pm (Adult Ed, p. 10)

12 Friday

Sharks of the San Francisco Bay
5:45 (Downtown Lecture, p. 9)

13 Saturday

American Ragtime Music
1 pm (Trad. Arts, p. 11)
Assembling California Field
Trip
9:00 am to 4:00 pm
(Adult Ed., p. 10)

18 Thursday

Iroquois Masks, (see Feb. 25)

19 Friday

Invasive Species and San
Francisco Bay
5:45 (Downtown Lecture, p. 9)

20 Saturday

Jewish Storytelling
1 pm (Trad. Arts, p. 11)
Special Guests/ Masters of
the Night
2:30 pm (p. 11)

23 Tuesday

Illustrating Bats
7-10 pm (Adult Ed., p. 10)
Equinox II: Music Inspired by
the Cosmos
8 pm (Morrison Planetarium,
p. 12)

27 Saturday

The History of Bagpipes
1 pm (Trad. Arts, p. 11)
Special Guests/Masters of
the Night, 2:30 pm (p. 11)

28 Sunday

African-American Film Festival
1-5 pm (Morrison Auditorium,
p. 11)

30 Tuesday

Illustrating Bats, 7-10 pm (p. 10)

VISITOR INFORMATION

Special Exhibitions:

EARTHQUAKE
permanent exhibit
Pacific Currents
through February 28
The Artist's Universe
no ending date
*Masters of the Night: The True
Story of Bats*
February 13 through May 2
Witness
ongoing
Feeding Times:
Fish Roundabout, 2 pm
Penguins, 11:30 am & 4 pm
Guided Tours:
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daily

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